STATUS OF THE CLAIMS

1. (Cancelled).

2. (Previously presented) The system of claim 71 wherein said plurality of sensors are sensitive to a detected magnitude of forces oriented perpendicular to said plurality of sensors.

3. (Previously presented) The system of claim 71 wherein said plurality of sensors are sensitive to a detected magnitude of forces oriented parallel to said plurality of sensors.

4. (Previously presented) The system of claim 71 wherein said plurality of sensors are sensitive to a detected magnitude of forces oriented parallel to said plurality of sensors and a detected magnitude of forces oriented perpendicular to said plurality of sensors.

5. (Previously presented) The system of claim 71 wherein said layer with said plurality of sensors is mounted in a shoe.

6. (Previously presented) The system of claim 71, wherein said layer with said plurality of sensors is mounted in a stocking.

7. (Previously presented) The system of claim 71, wherein said layer with said plurality of sensors is mounted in a sandal.

8. (Previously presented) The system of claim 71, wherein said layer with said plurality of sensors is insertable into a shoe.

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9. (Previously presented) The system of claim 71, wherein said layer with said plurality of sensors is insertable into a stocking.

10. (Previously presented) The system of claim 71, wherein said layer with said plurality of sensors is insertable into a sandal.

11.-14. (Cancelled).

15. (Previously presented) The system of claim 71, wherein said signal processing subsystem is further operable to:

convert said balance information signals into at least one estimate of a position of force applied to a sole of said at least one foot; and

wherein said balance control signals encode said position of force applied to a sole of said user's foot.

16. (Previously presented) The system of claim 71 wherein said signal processing subsystem is further operable to:

convert said balance information signals into an estimate of an orientation of force applied to a sole of said user's foot; and

wherein said balance control signals encodes said orientation of force applied to the sole of said user's foot.

17. (Previously presented) The system of claim 71, wherein the signal processing subsystem is further operable to:

convert said balance information signals into at least one estimate of a portion of a total body weight of said user applied to a sole of said user's foot and;

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wherein said at least one stimulation control signal encodes said portion of said total body weight of said user applied to said sole.

18. (Previously presented) The system of claim 71, wherein said signal processing subsystem is further operable to:

determine a magnitude of a resultant reaction force applied to a sole of said user's foot by

calculating a sum equal to the total force applied to all sensors within said plurality of sensors, and

dividing said sum by a total body weight of said user.

19.-20. (Cancelled).

21. (Previously presented) The system of claim 71, wherein said stimulators comprise at least one stimulator adapted to be implanted into said user's skin.

22.-24. (Cancelled).

25. (Previously presented) The system of claim 71 wherein said stimulators are adapted to produce vibrational stimuli to said user's skin.

26. (Previously presented) The system of claim 71, wherein said stimulators are operable to produce electrical stimuli to said user's skin.

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27. (Previously presented) The system of claim 71, wherein said stimulators are operable to produce electrocutaneous stimuli to said user's skin.

28.-29. (Cancelled).

30. (Previously presented) The system of claim 71, wherein said stimulators are operable to produce thermal stimuli to said user's skin.

31. (Previously presented) The system of claim 71, wherein said stimulators are configured for placement on the skin of at least one leg of said user.

32. (Currently amended) The system of claim 71, wherein said stimulators are <u>further</u> configured for placement on trunk skin of said user.

33. (Currently amended) The system of claim 71, wherein said stimulators are <u>further</u> configured for placement on head skin of said user.

34. (Previously presented) The system of claim 71, wherein said array of a plurality of stimulators is configured to be mountable proximate to a leg of said user in a plane substantially parallel to a plane of an ipsilateral foot sole.

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35. (Previously presented) The system of claim 71 wherein said stimulators are configured to stimulate a sole of said user's foot.

36. (Previously presented) The system of claim 71 wherein said stimulators are responsive to said balance control signals such that at least one stimulus characteristic selected from the group comprising amplitude, frequency, and location correlates to forces applied to said user's foot.

37. (Previously presented) The system of claim 71, further comprising:

at least one sensor of said plurality of sensors is adapted for sensing an angle between at least one foot and the ipsilateral lower leg, and for transmitting an ankle angle signal to said signal processing subsystem representation thereof; and

wherein said signal processing subsystem receives said ankle angle signal, and provides at least one stimulation control signals, responsive to said ankle angle signal.

38. (Previously presented) The system of claim 71, further comprising:

at least one sensor of said plurality of sensors is adapted for sensing an angle between at least one lower leg and the ipsilateral upper leg of said user, and for transmitting a knee angle signal representation thereof to said signal processing subsystem; and

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wherein said signal processing subsystem receives said knee angle signal, provides at least one stimulation control signal, responsive to said knee angle signal.

39.-70. (Cancelled).

71. (Currently amended) A system for assisting the maintenance of balance over time during standing and gait of a user comprising:

a sensing layer adapted for user wearing under a user's foot during conditions of standing and gait, said layer having a plurality of sensors positioned for sensing two dimensional force distribution under said user's foot;

excitation means for said sensors which, during user standing and gait, provide signals representing user balance information as a function of said two dimensional force distribution over time;

said sensing layer adapted to transmit said balance information signals to a remote location under conditions of standing and gait;

a signal processing subsystem at said remote location and adapted to be user wearable, said subsystem configured to receive said balance information signals and to provide in response thereto balance control signals containing temporal and spatial information reflecting said force distribution for use in user skin stimulation;

an array of a plurality of stimulators adapted for attachment in contact with a skin area of <u>at least one lower extremity of</u> said user; and

said plurality of stimulators arranged in a two dimensional array and responsive to said balance control signals to provide

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skin stimulation to said at least one lower extremity of said user in a form reflecting said two dimensional force distribution under said user's foot both spatially and temporally in said two dimensional force distribution over time, both under conditions of standing and gait, to thereby provide feedback to the user via the array of plural stimulators to provide individualized spatial mapping and temporal information to allow complex, multi-dimensional and time varying corrective action.

72. (Currently amended) A system for assisting the maintenance of balance over time during standing and gait of a user comprising:

a sensing layer adapted for user wearing under a user's foot during conditions of standing and gait, said layer having a plurality of sensors positioned for sensing two dimensional force distribution under said user's foot;

excitation means for said sensors which, during user standing and gait, provide signals representing user balance information as a function of said two dimensional force distribution over time;

said sensing layer adapted to transmit said balance information signals to a remote location under conditions of standing and gait;

a signal processing subsystem at said remote location and adapted to be user wearable, said subsystem configured to receive said balance information signals and to provide in response thereto balance control signals containing temporal and spatial information reflecting said force distribution for use in user skin stimulation;

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an array of a plurality of stimulators adapted for attachment in contact with a skin area of at least one lower extremity of said user;

said stimulators arranged in plural vertically separated horizontal rows; and

said plurality of stimulators responsive to said balance control signals to provide skin stimulation to said user in a form reflecting said two dimensional force distribution under said user's foot both spatially and temporally in said balance control signals to provide skin stimulation to said at least one lower extremity of said user reflecting said two dimensional force distribution changes over time both under conditions of standing and gait, to thereby provide feedback to the user via the array of plural stimulators to provide individualized spatial mapping and temporal information to allow complex, multi-dimensional and time varying corrective action.

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